

REMARKS

The drawings and specification are being amended herein in response to the drawings objection and request for headings. The specification is also being amended on page 9 to correct the erroneous use of mm instead of μ m. Support for this is found in the first paragraph on page 18 of the specification. We also note that this was corrected in the corresponding issued European application (i.e., EP 983 131 B1).

With respect to the refusal to consider the Information Disclosure Statement of April 5, 2001 because copies were not included under 37 CFR 1.98(a)(2) in paragraph 4 of the Office Action, applicants note that the Information Disclosure Statement recited:

Under 35 USC §120, this application relies on the earlier filing date of application serial number 09/422,758, filed on October 21, 1999. All but one of these references (i.e., U.S. 5,750,950) were submitted to and/or cited by the Office in the prior application and, therefore, are not provided in this application.

37 CFR 1.98(d)(2) provides that one need not provide copies when such an earlier application is properly identified in the information disclosure statement and the statement submitted in the earlier application complies with paragraphs (a) through (c). These conditions were met, and the references thus should have been considered. Applicants include clean copies of the 1449 forms and ask the examiner to consider the references and return copies of the forms indicating consideration of the references.

Claim 22 has been amended to exclude unnecessary limitations and in response to the rejection under 35 U.S.C. 112, second paragraph. New dependent claim 41 is being added herein; it is supported at page 15, lines 19-22 and Fig. 30.

Independent claim 22 generally relates to making an electroformed shaving cutter (e.g., the foil in an electric razor). In such manufacture, a photoresist material is applied to an electrically conductive surface of a substrate of the desired shape for the cutter, the photoresist material is exposed through a mask and developed, and then a metallic layer is deposited onto the conductive surface at regions that are not coated with the photoresist. The cited Otsuka U.S.

Patent No. 5,473,818 describes such a use of photoresist 37 to prevent metal deposition at areas covered by the photoresist during electroforming of a foil.

In such electroforming, the photoresist material typically is applied to the substrate in liquid form by dipping or is applied in the form of a preformed thin plastic film, and there is a possibility of drips when using liquid dipping (leading to nonuniform thickness) and creases and folds (particularly on curved shapes) when using the film. (See, e.g., page 13, lines 9-19 of the specification.)

The invention, as claimed in independent claim 22, is directed to a particular technique for applying the photoresist material to the substrate. In particular, the photoresist material is electrophoretic and an electric current is passed through the coating while it is being applied. As described in the specification at page 13, lines 20-33:

This problem can be addressed by the use of an electrophoretic photoresist. Such a resist can be applied to a mandrel by the passage of electrical current. This not only causes the photoresist to adhere firmly to the substrate, but also produces a uniform thickness. Since the photoresist is non-conductive, the thickness is self-limiting. Thus, when the required thickness is achieved, the passage of electric current ceases and the deposition process is arrested. The thickness may nevertheless be controlled by adjustment of solution temperature, current density, voltage and deposition time. Such photoresists thus have the advantage of coating the whole mandrel with a film of uniform thickness irrespective of the shape of the mandrel.

Independent claim 22 stands rejected under 35 U.S.C. 102(b) on the basis of Otsuka et al., Figs. 20-23C, col. 10, lines 1-26.

As noted above, Otsuka U.S. Patent No. 5,473,818 describes the use of photoresist 37 to prevent metal deposition at areas covered by the photoresist during electroforming of a foil. Otsuka is silent as to the type of photoresist material used and how it is applied. Otsuka does not disclose or suggest step (b) because Otsuka does not disclose or suggest using an electrophoretic photoresist and Otsuka does not disclose or suggest passing an electrical current through the photoresist material while it is being applied.

Independent claim 22 accordingly is not anticipated or obvious and is allowable under 35 USC 102(b) and 103(a). Claim 24 and new claim 41, which depend on claim 22 are allowable for the same reasons.

Applicant : Charles C. Packham et al.
Serial No. : 09/826,720
Filed : April 5, 2001
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Also, claims 23, 25-31 and 38-40, which were subject to restriction, depend on claim 22. Since claim 22 is allowable, these claims should be allowed as well.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Enclosed is a \$400 check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the specification:

Paragraph beginning at page 9, line 10 has been amended as follows:

--The top surface 116 will be perforated with non-elongated apertures of the size conventionally used in shaver foils, e.g. 400-800 μm [mm] diameter. The concentric concave and convex side skirts 114 and 115 may also be provided with hair receiving apertures of the conventional size. However, they may also be provided with elongate hair capture slots for improved capture of long hairs. Such elongate slots may typically have dimensions 2000 μm [mm](maximum) x 200 μm [mm](minimum). The foil is manufactured by electroforming in one piece and is open at its base. By virtue of its shape, the foil has an arcuate longitudinal centre line, like a banana, and may be a sector of a torroid.--

Paragraph beginning at page 10, line 32 has been amended as follows:

--Figs. 10 to 22 show a modified embodiment of the invention including a straight shaving foil 100 having a parabolic shaving surface and closed elliptic end cheeks 101, 102. Fig. 11 shows a longitudinal sectional view taken along line A - A of Fig. 10. The view of Fig. 11 shows the undercutter [118] 181, which is constructed in a substantially conventional way. Fig. 12 is a cross-section taken along line B - B of Fig. 11.--

Paragraph beginning at page 23, line 1 has been amended as follows:

--Fig. 27 shows the mask 242 with its foil aperture pattern [243] 244. Fig. 28 shows the polished mandrel 261 coated with photoresist ready to receive the mask 242.--

Paragraph beginning at page 22, line 19, has been amended as follows:

--5.2 As shown in Fig. 32, develop the mandrel pattern in "Developer"TM 41 while stirring with a stirrer 42 and at 20-50°C, preferably 26°C until the aperture pattern is just visible; note the time taken and continue the immersion for the same period.--

In the claims:

Claim 22 has been amended as follows:

22. (Twice Amended) A method of producing an electroformed shaving cutter comprising:

- a) providing a substrate that [in an at-rest position] has an [substantially three-dimensional] electrically conductive surface;
- b) applying a coating of electrophoretic photoresist to the electrically conductive surface by passing an electrical current therethrough;
- c) exposing the photoresist to a suitable source of electromagnetic radiation through a mask [whose] that is shaped to [shape] conform[s closely] to that of [the] said electrically conductive surface of said substrate;
- d) developing the photoresist; and
- e) electrodepositing a metallic layer onto conductive surface regions of the substrate not coated with the photoresist.



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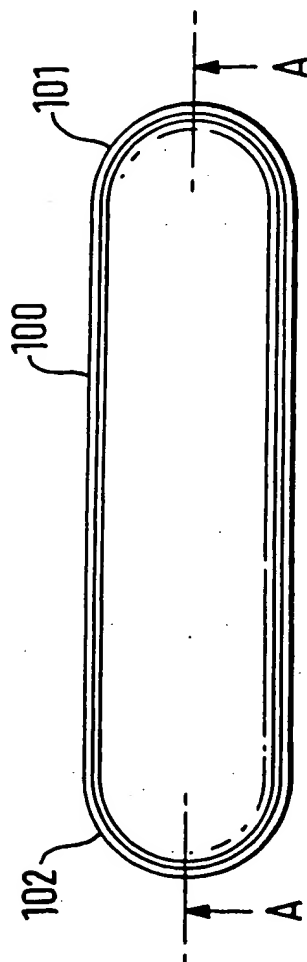


FIG. 10

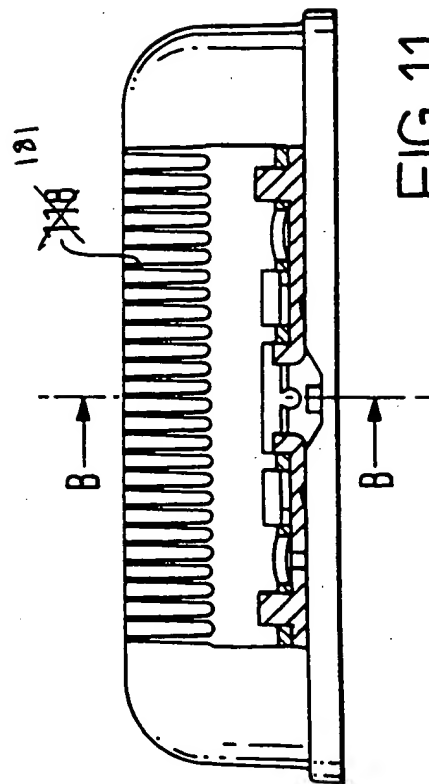


FIG. 11

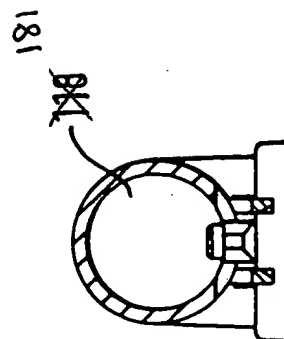
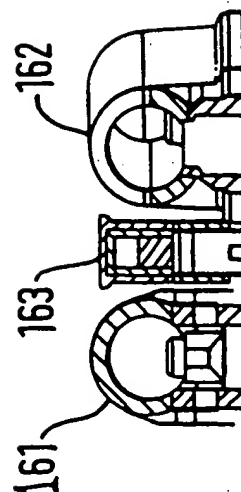
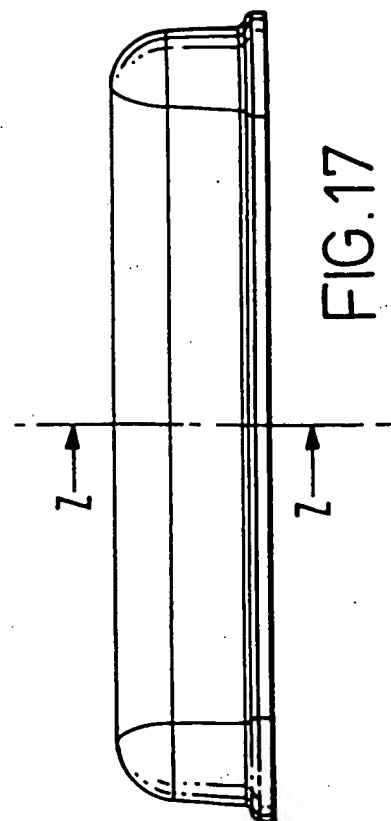
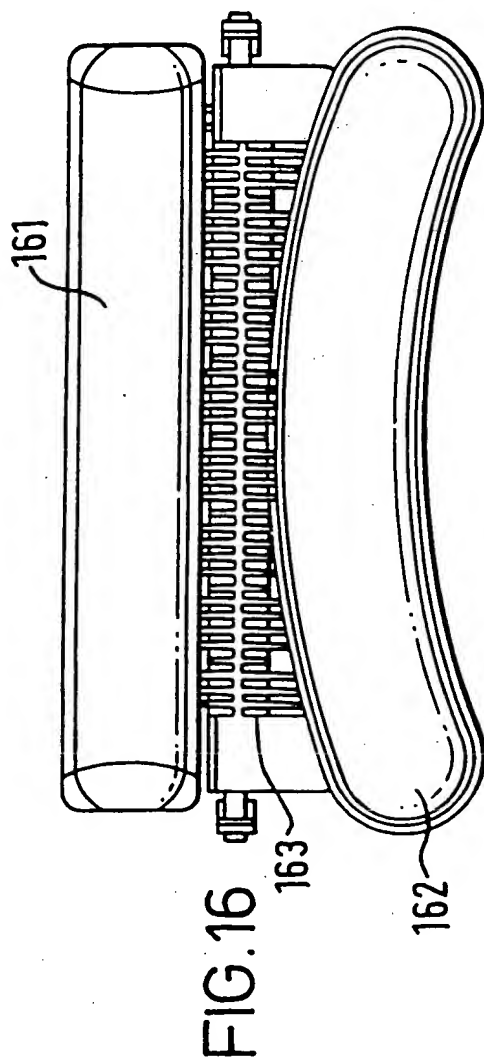


FIG. 12

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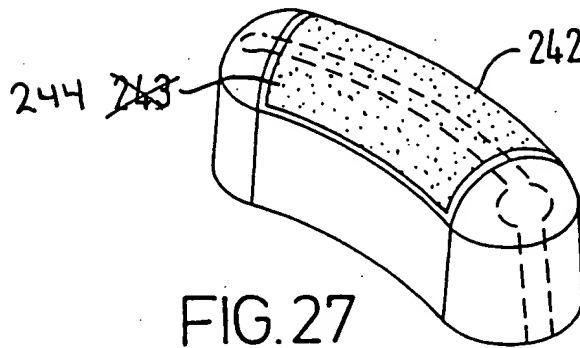


FIG. 27

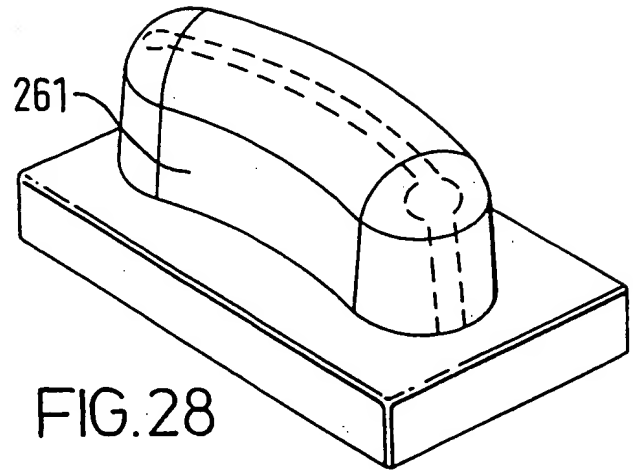


FIG. 28

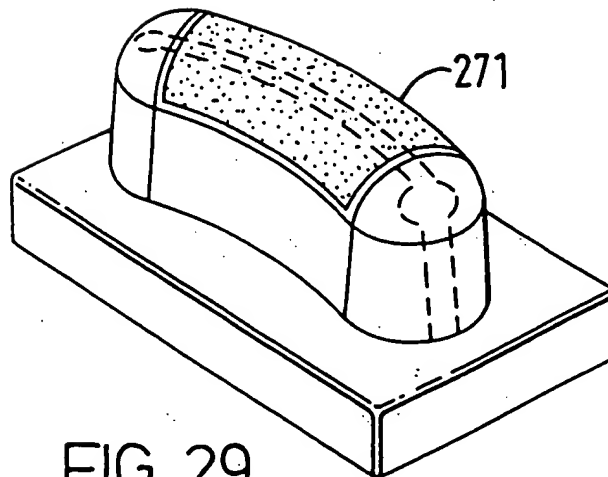


FIG. 29

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FIG. 32

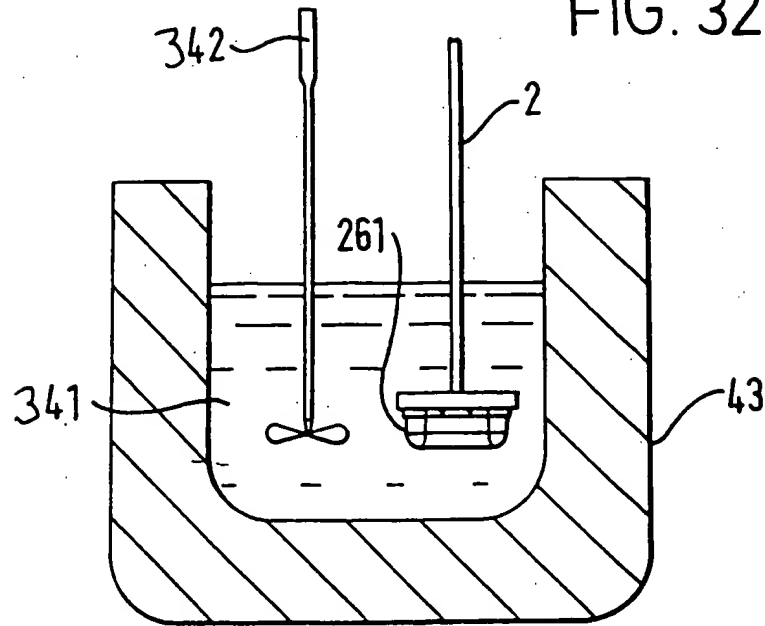
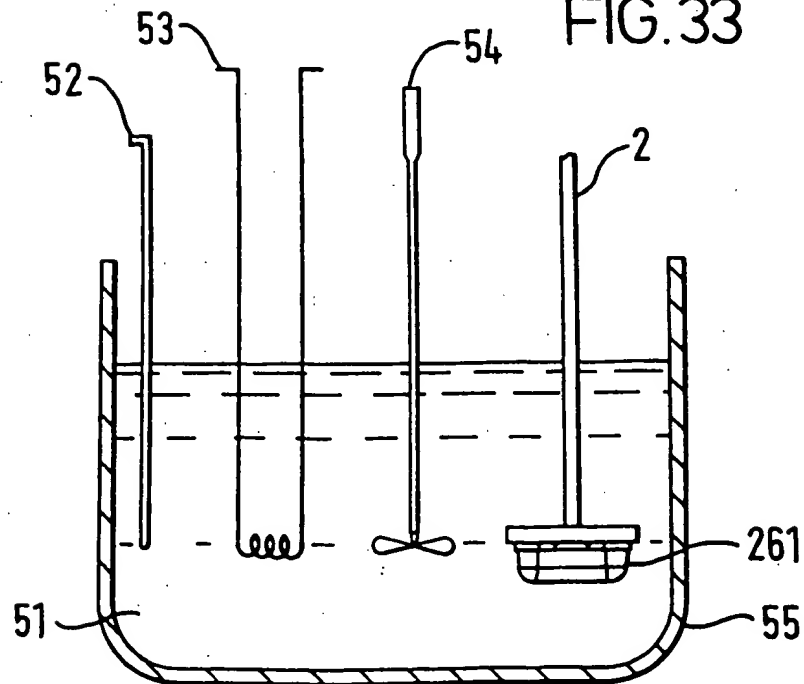


FIG. 33



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